

ABSTRACT

The present invention is embodied in a video flashlight method. This method creates virtual images of a scene using a dynamically updated three-dimensional model of the scene and at least one video sequence of images. An estimate of the camera pose is generated by comparing a present image to the three-dimensional model. Next, relevant features of the model are selected based on the estimated pose. The relevant features are then virtually projected onto the estimated pose and matched to features of the image. Matching errors are measured between the relevant features of the virtual projection and the features of the image. The estimated pose is then updated to reduce these matching errors. The model is also refined with updated information from the image. Meanwhile, a viewpoint for a virtual image is selected. The virtual image is then created by projecting the dynamically updated three-dimensional model onto the selected virtual viewpoint.